

LISTING OF THE CLAIMS:

Claims 1-6 (Cancelled).

7. (Currently Amended) A knee prosthesis, which is implantable in the knee joint of a patient, said prosthesis comprising a femoral component (1)[,] ~~which is selected from the group of materials consisting of metal and ceramics and~~ is implantable in the femur of the knee joint; a ~~tribial~~ tibial component (2) ~~which is selected from the group of materials consisting of metal and ceramics and~~ is implantable in the tibia of the knee joint; and an intermediate insert (3) ~~constituted of a plastic material~~ which is interposed between the tibial component and the femoral component of said prosthesis, said insert being selectively rigidly integral with the tibial component or movable in rotation about a vertical axis relative to the tibial component, said femoral component comprising two lateral parts (7), each with a condylar surface which bears against and is movable in two lateral cavities (8) of a complementary profile provided in the insert, and includes a hollowed central part (10) arranged between said lateral ~~condylar~~ parts and which bears on a projecting central part (9) of the insert, the projecting central part (9) ~~of the surface~~ of the insert (3), which is directed toward the femoral component (1) having a convex shape in a frontal plane, and a concave shape in a sagittal plane, the hollowed central part (10) of the femoral component (1) having a concave shape in a frontal plane, and a convex shape in a sagittal plane extending

from the front to the rear of the femur of the knee joint, so as to facilitate the femoral component (1) straddling the projecting central part (9) of the insert during relative displacements thereof and to cooperate cam-like therewith, said knee prosthesis having ~~the surfaces of~~ the femoral component (2) and ~~of~~ the insert (3) come into mutual surface contact during the relative movements between said femoral ~~components~~ component and said insert in the absence of any ~~discontinuity or~~ discontinuities, flats and sharp edges and cooperate through the straddling of any concave parts and convex parts of said femoral component and of said insert during the entirety of these movements within, respectively, each of the sagittal and frontal planes, wherein transversely in a frontal plane, the ~~contact surface of the~~ insert (3), which is directed towards the ~~complementary~~ mutual contact surface of the femoral component and coming into continuous medio-lateral contact with the femoral component (1) is a curve (S2) which includes a projecting central part (9) having an inwardly curved central portion possessing a convexity which is directed towards the femoral component and which connects tangentially on opposite sides thereof to lateral cavity (8) having a shape corresponding substantially with that of a therewith associated condylar part of the femoral component (1), forming an undulating curve across the entire extent thereof in the absence of ~~any discontinuity or sharp edge~~ discontinuities, flats and sharp edges in all directions, in a generally sinusoidal configuration, and wherein transversely in a frontal plane, the surface of the femoral

component (1), which is directed towards the complementary surface of the insert coming into continuous medio-lateral contact with the insert (3) defines a curve (S1) which includes a ~~projecting~~ hollowed central part ~~(9)~~ (10) having a ~~hollowed~~ an undulating shape with a concavity which is directed towards the insert and which connects tangentially on opposite sides thereof to the ~~condylar~~ lateral parts (7) of the femoral component (1), forming an undulating curve, in the absence of any ~~discontinuity or sharp edge~~ discontinuities, flats and sharp edges, of generally a sinusoidal configuration across the entirety thereof, which follows the ~~entire articular~~ surface of the femoral component and of the insert from its the most frontal ~~part~~ parts to the rearmost ~~part~~ parts thereof ~~and of the insert~~, the mutual contact surface of the femoral component being defined by the combination of a spiral curve extending in the sagittal ~~plane~~ planes following from medial to lateral an undulating ~~curve of~~ sinusoidal-like curve type in a the frontal plane, ~~the contact surface of the insert (3) being defined by the combination of~~ having a spiral curve in the sagittal plane ~~and of~~ an undulating curve of following a sinusoidal-like curve extending configuration in the frontal plane, in the absence of any discontinuities, flats and sharp edges, in correlation with the configuration of at least a portion of the spiral curve in all sagittal planes of said femoral component, said two femoral component and insert surfaces being in a concave-convex engagement in each of said two planes, whereby the two mutual contact surfaces provide for a continuous transverse medio-lateral contact from complete extension to complete flexion of the prosthesis.

Claims 8 and 9 (Cancelled).

10. (Currently Amended) The prosthesis as claimed in Claim 7, wherein the ~~econdylar~~ lateral parts and the hollowed central part (10) of the femoral component (1) extending transversely through at least one sagittal plane, have the shape of a spiral curve of any geometrical form, and wherein extending transversely through a sagittal plane, the complementary ~~econdylar~~ lateral parts (8) and the projecting central part (9) of the insert (3) also have the shape of a spiral curve of any geometrical form, which are at least partly the shape of the spiral curve of the femoral component.

11. (Currently Amended) The prosthesis as claimed in Claim 7, wherein the projecting central part (9) of the insert (3) and the hollowed central part (10) of ~~the~~ an intercondylar space of the femoral component (1) have, in the sagittal plane, two curvatures which cooperate cam-like, said cam-like motion being such that, at an angle of flexion of 0°, the center of the bearings of the femoral component against the insert is a few millimeters in front of the center of the insert (3), such that said center retreats a few millimeters behind the center of the insert, as the prosthesis enters into flexion.

12. (Currently Amended) The prosthesis as claimed in Claim 7, wherein said prosthesis comprises:

- a system with three zones of bearing between the femoral component (1) and the insert (3);
- a system having medio-lateral continuity of the contact between the bearing surfaces of the femoral component (1) and of the insert (3);
- a succession of concave or convex surface segments having the form of a spiral in profile;
- the concave ~~parts~~ surface segments of the femoral ~~surface~~ component corresponding to convex tori ~~of on~~ on the bearing surface of the insert;
- the convex ~~parts~~ surface segments of the femoral ~~surface~~ component corresponding to concave tori ~~of on~~ on the bearing surface of the insert (3);
- in the frontal plane, a succession of fitting engagements of the femoral component in the insert, which are successively convex-concave, then concave-convex, extending from the medial condyle to the lateral condyle; and
- the three surfaces of the femoral component (1), medial, central and lateral, defining, when viewed in the sagittal plane, a downwardly directed convexity, whereas the three surfaces of the insert (3) have an upwardly directed concavity, so as to provide a central zone of saddle shape but facilitating a continuous medio-lateral contact.

Claims 13 and 14 (Cancelled).

15. (Currently Amended) A knee prosthesis, which is implantable in the knee joint of a patient, said prosthesis comprising a femoral component (1)[,] ~~which is selected from the group of materials consisting of metal and ceramics and is implantable in the femur of the knee joint;~~ a tibial component (2) ~~which is selected from the group of materials consisting of metal and ceramics and is implantable in the tibia of the knee joint;~~ and an intermediate insert (3) ~~constituted of a plastic material~~ which is interposed between the tibial component and the femoral component of said prosthesis, said insert being selectively rigidly integral with the tibial component or movable in rotation about a vertical axis relative to the tibial component, said femoral component comprising two lateral parts (7), each with a condylar surface which bears against and is movable in two lateral cavities (8) of a complementary profile provided in the insert, and includes a hollowed central part (10) arranged between said lateral ~~condylar~~ parts and which bears on a projecting central part (9) of the insert, the projecting central part (9) ~~of the surface~~ of the insert (3), which is directed toward the femoral component (1) having a convex shape in a frontal plane, and a concave shape in a sagittal plane, the hollowed central part (10) of the femoral component (1) having a concave shape in a frontal plane, and a convex shape in a sagittal plane extending from the front to the rear of the femur of the knee joint, so as to facilitate the femoral component (1) straddling the projecting central part (9) of the insert during relative displacements thereof and to cooperate cam-like therewith, said knee prosthesis having ~~the surfaces of~~ the femoral component (2) and ~~of~~ the insert (3) come into

mutual surface contact during the relative movements between said femoral components component and said insert in the absence of any ~~discontinuity or~~ discontinuities, flats and sharp edges and cooperate through the straddling of any concave parts and convex parts of said femoral component and of said insert during the entirety of these movements within, respectively, each of the sagittal and frontal planes, wherein transversely in a frontal plane, the ~~contact surface of the~~ insert (3), which is directed towards the ~~complementary~~ mutual contact surface of the femoral component and coming into continuous medio-lateral contact with the femoral component (1) is a curve (S2) which includes a projecting central part (9) having an inwardly curved central portion possessing a convexity which is directed towards the femoral component and which connects tangentially on opposite sides thereof to lateral cavity (8) having a shape corresponding substantially with that of a therewith associated condylar part of the femoral component (1), forming an undulating curve across the entire extent thereof in the absence of ~~any discontinuity~~ discontinuities, flats or and sharp edge, in a generally sinusoidal configuration, and wherein transversely in a frontal plane, the surface of the femoral component (1), which is directed towards the complementary surface of the insert coming into continuous medio-lateral contact with the insert (3) defines a curve (S1) which includes a ~~projecting~~ hollowed central part (9) (10) having a ~~hollowed~~ an undulating shape with a concavity which is directed towards the insert and which connects tangentially on opposite sides thereof to the ~~condylar~~ lateral parts (7) of the femoral component (1), forming an undulating curve

in the absence of any ~~discontinuity~~ discontinuities, flats ~~or~~ and sharp ~~edge~~ edges of generally a sinusoidal configuration across the entirety thereof, which follows the ~~entire articular~~ surface of the femoral component from its most frontal part to the rearmost part thereof and of the insert, said mutual contact surface of the femoral component (1) being defined by a spiral curve extending in the sagittal plane following said sinusoidal configuration from medial to lateral, and said mutual contact surface of the insert being defined by a spiral curve extending on the sagittal plane in correlation with the configuration of at least a portion of the spiral curve in the sagittal plane of said femoral component.

Claims 16 and 17 (Cancelled).

18. (Currently Amended) A knee prosthesis, which is implantable in the knee joint of a patient, said prosthesis comprising a femoral component (1)[,] ~~which is selected from the group of materials consisting of metal and ceramics and~~ is implantable in the femur of the knee joint; a tibial component (2) ~~which is selected from the group of materials consisting of metal and ceramics and~~ is implantable in the tibia of the knee joint; and an intermediate insert (3) ~~constituted of a plastic material~~ which is interposed between the tibial component and the femoral component of said prosthesis, said insert being selectively rigidly integral with the tibial component or movable in rotation about a vertical axis relative to the tibial component, said femoral

component comprising two lateral parts (7), each with a condylar surface which bears against and is movable in two lateral cavities (8) of a complementary profile provided in the insert, and includes a hollowed central part (10) arranged between said lateral ~~condylar~~ parts and which bears on a projecting central part (9) of the insert, the projecting central part (9) ~~of the surface~~ of the insert (3), which is directed toward the femoral component (1) having a convex shape in a frontal plane, and a concave shape in a sagittal plane, the hollowed central part (10) of the femoral component (1) having a concave shape in a frontal plane, and a convex shape in a sagittal plane extending from the front to the rear of the femur of the knee joint, so as to facilitate the femoral component (1) straddling the projecting part (9) of the insert during relative displacements thereof and to cooperate cam-like therewith, said knee prosthesis having the surfaces of the femoral component ~~(2)~~ (1) and of the insert (3) come into mutual surface contact during the relative movements between said femoral component ~~components~~ in the absence of any ~~discontinuity or discontinuities, flats and~~ sharp edges and cooperate through the straddling of concave parts and convex parts thereof during the entirety of these movements within, respectively, each of the sagittal and frontal planes, wherein transversely in a frontal plane, the mutual contact surface of the insert (3), which is directed towards the complementary mutual contact surface of the femoral component (1) and coming into continuous medio-lateral contact with the femoral component (1) is a curve (S2) which includes a projecting central part (9) having an inwardly curved central portion possessing a convexity

which is directed towards the femoral component (1) and which connects tangentially on opposite sides thereof to each said lateral cavity (8) having a shape corresponding substantially with that of a therewith associated ~~condylar~~ lateral part of the femoral component (1), forming an undulating curve in a generally sinusoidal configuration, and wherein transversely in a frontal plane, the surface of the femoral component (1), which is directed towards the complementary surface of the insert coming into continuous medio-lateral contact with the insert (3) defines a curve (S1) which includes a ~~projecting~~ hollowed central part (9) (10) having ~~a hollowed~~ an undulating shape with a concavity which is directed towards the insert and which connects tangentially on opposite sides thereof to the ~~condylar~~ lateral parts (7) of the femoral component (1), forming an undulating curve in the absence of any ~~discontinuity or discontinuities, flats and sharp edge edges~~ of generally a sinusoidal configuration, which follows the ~~entire articular~~ mutual contact surface of the femoral component and of the insert from its most frontal part to the rearmost part thereof ~~and of the insert~~, the femoral contact surface of the femoral component being defined by the combination of a spiral curve in the sagittal plane following an undulating curve of sinusoidal type in a frontal plane, the contact surface of the insert (3) being defined by the combination of a spiral curve in the sagittal plane in conformance with at least a portion of the spiral curve of the femoral component, and of an undulating curve of sinusoidal configuration in the frontal plane, said two surfaces being in a concave-convex engagement in each of said two planes, whereby the two surfaces provide for a

continuous transverse medio-lateral contact from complete extension to complete flexion of the prosthesis.

Claims 19 and 20 (Cancelled).

21. (Currently Amended) The prosthesis as claimed in Claim 18, wherein the ~~condylar~~ lateral parts and the hollowed central part (10) of the femoral component (1) extending transversely through at least one sagittal plane, have the shape of a spiral of any geometrical form, and wherein extending transversely through a sagittal plane, the complementary ~~condylar~~ lateral parts (8) and projecting central part (9) of the insert (3) also have the shape of a spiral of any geometrical form.